

1. (Cancelled.)

2. (Cancelled.)

3. (Cancelled.)

4. (Cancelled.)

5. (Cancelled.)

6. (Cancelled.)

7. (Cancelled.)

8. (Cancelled.)

9. (Cancelled.)

10. (Cancelled.)

11. (Cancelled.)

12. (Cancelled.)

13. (Cancelled.)

14. (Cancelled.)

15. (Cancelled.)

16. (Cancelled.)

17. (Cancelled.)

18. (Cancelled.)

19. (Cancelled.)

20. (Cancelled.)

21. (Cancelled.)

22. (Cancelled.)

23. (Cancelled.)

24. (Cancelled.)

25. (Cancelled.)

26. (Cancelled.)

27. (Currently Amended) A surface emitting semiconductor laser comprising:

(a) a semiconductor structure including a substrate and an epitaxial structure on

the substrate, the epitaxial structure including a layer with an active region at which light emission occurs, an upper cladding layer above the active region layer and a lower cladding layer below the active region layer to surround the active region layer, the semiconductor structure having an upper face, a lower face, and edge faces that terminate the semiconductor structure longitudinally, and electrodes at the upper and lower faces by which voltage can be applied across the epitaxial structure and the substrate;

(b) a distributed feedback grating incorporated with the epitaxial structure and terminating longitudinally at ends thereof, comprising periodically alternating grating elements to provide optical feedback as a second order grating for a selected effective wavelength of light generation from the active region, the grating having a spacing between adjacent grating elements at a position intermediate the ends of the grating that corresponds to a selected phase shift in the grating, the grating formed and positioned to act upon the light generated in the active region to produce lasing action and emission of light from at least one of the upper and lower faces; and

(c) distributed Bragg reflector gratings incorporated with the epitaxial structure and adjacent to each of the longitudinal ends of the distributed feedback grating to reflect light back

longitudinally to the distributed feedback grating with structure blocking current flow through the distributed Bragg reflector gratings.

28. (Original) The semiconductor laser of Claim 27 wherein the distributed feedback grating is formed of alternating reflective elements and transmissive elements.

29. (Original) The semiconductor laser of Claim 28 wherein the reflective grating elements are formed of gold.

30. (Original) The semiconductor laser of Claim 29 wherein the gold elements in the grating are separated by air.

C / 31. (Original) The semiconductor laser of Claim 27 including means for confining the current from the electrodes to a stripe region.

Cont. 32. (Previously Amended) The semiconductor laser of Claim 27 wherein the electrodes are formed on the upper and lower faces of the semiconductor laser and the upper electrode is formed on a cap layer to define an active stripe width over the active region layer at which light emission occurs.

33. (Original) The semiconductor laser of Claim 32 wherein the active region layer is formed of InGaAsP confinement layers and at least one InGaAs quantum well layer between the InGaAsP confinement layers, and the lower and upper cladding layers are formed of n-type InGaP and p-type InGaP, respectively, and the substrate is formed of GaAs.

34. (Original) The semiconductor laser of Claim 32 wherein the active region layer has multiple quantum wells defined by layers of InGaAs separated by InGaAsP confinement layers.

35. (Original) The semiconductor layer of Claim 32 including a cap layer of P-type GaAs over the upper cladding layer and wherein the grating is formed into the cap layer.
36. (Original) The semiconductor laser of Claim 27 wherein both edge faces are formed to be antireflective.
37. (Original) The semiconductor laser of Claim 27 wherein the spacing is in the middle of the grating.
38. (Original) The semiconductor laser of Claim 37 wherein the spacing in the grating corresponds to a grating phase shift of about 180°.
39. (Original) The semiconductor laser of Claim 27 wherein the distributed Bragg reflector gratings are first order gratings.
40. (Original) The semiconductor laser of Claim 27 wherein the distributed Bragg reflector gratings are second order gratings.
41. (Original) The semiconductor laser of Claim 27 including an insulating layer over the distributed Bragg reflector gratings to inhibit current flow through these gratings.
42. (Original) The semiconductor laser of Claim 27 wherein one of the electrodes is formed on the lower face and has a window opening formed therein to permit light emission therethrough.
43. (Original) The semiconductor laser of Claim 27 wherein the spacing in the grating corresponds to a grating phase shift of about 180°.